

Students' Learning Preferences and Motivation

Lota G. Duriga¹, Rosalinda C. Tantiado²

¹Southern de Oro Philippines College, Cagayan de Oro City, Philippines

²DepEd Cagayan de Oro City Division, Cagayan de Oro City, Philippines

ABSTRACT: Understanding the basis on how students learn and what drives them to learn is essential for educators to enhance learning outcomes. This study assessed the level of students' learning preferences, and motivation, and the relationship between students' learning preferences and motivation. The study employed descriptive correlational and causal research designs. A total of one hundred sixty-seven (167) Grade 10 learners answered the adapted questionnaire. The study utilized statistical measures such as the Mean, Standard Deviation, and Pearson Product Moment Correlation Coefficient (r). The study found that the respondents have a very high level of tactile learning preference as they love to have practical experience to comprehend and remember information. Results also revealed that the respondents have a high level of extrinsic motivation as they prefer external rewards for their actions. A significant relationship exists between the students' learning preferences and their motivation. Thus, hands-on engagement and external incentives strongly resonate with the respondents. Continuous guidance and inspiration from the learning facilitators are recommended to empower learners to reach their full potential.

KEYWORDS: extrinsic motivation, learning preference, motivation, tactile

I. INTRODUCTION

Learning is a multifaceted process through which students acquire knowledge, skills, and attitudes, facilitated by active engagement, constructive interactions, and reflective practices. Students, as individuals with unique backgrounds, abilities, and interests, embark on a journey of intellectual growth within educational environments where they are supported, challenged, and inspired by educators and peers. Grounded in theories of constructivism and cognitive development, learning is shaped by social interactions, differentiated instruction, and metacognitive awareness, fostering deep understanding, critical thinking, and lifelong learning skills. Motivated by intrinsic curiosity, academic goals, and external incentives, students navigate through diverse learning experiences, embracing challenges, persevering through obstacles, and ultimately evolving into self-directed learners prepared to thrive in an ever-evolving world.

Learning motivation determine which way people process and learn information the best. It may fall into three categories: visual learners, auditory learners, and tactile learners (Elrick, 2018). Students have their own preferences and reason in choosing the learning style that is most effective to them, and they tend to learn best when information are presented in this type of style. Determining the learning styles of students will ultimately improve their educational experience. This will also provide both teachers and students with positive feedback on their strengths and weaknesses in the teaching and learning scenario.

Likewise, knowledge of the learning styles can provide implications to curriculum design allowing teachers to implement a learner-centered curriculum model in the classroom. One of the important steps to undertake to ensure quality and optimal learning experience among students is to consider their different learning styles and preferences. In fact, Alavi and Toozandehjani (2017) concluded that having a background of the learning styles of students can enhance their learning and at the same time help students strengthen self-actualization. However, self-motivation also plays a vital role in students' learning atmosphere. It is the ability to do what needs to be done, without the influence from other people or situations (Business Dictionary, 2019).

Motivation is a combination of effort plus desire to achieve the goal of learning the language, plus favorable attitudes towards learning the language. Kharamah (2018) concluded that students' confidence in their academic performance out of the classroom resulted in student success. Such an account encourages the student to believe in their abilities and self-efficacy and be more academically motivated. Thus, addressing the challenge in facilitating learning conditions should be taken into consideration to help individuals to optimize their learning (Sighn, 2017).

Students' Learning Preferences and Motivation

Self-motivation is a basic desire that encourages individuals to achieve various fulfillments of their own needs. To fulfill the students' basic needs, the teacher only needs to take advantage of the students' natural curiosity by presenting material that is suitable and meaningful to students. It is important to increase students' motivation to provide opportunities for students to explore personally and allow them to find something meaningful through work (Wardani et al., 2020). Learners who are motivated by their own interests can identify learning objectives and the tasks necessary to reach them on their own. Intrinsic motivation is the desire to act which is caused by an internal driving factor.

In other words, individuals are compelled to behave towards certain goals without any external driving factors. Students who are intrinsically motivated to participate in learning activities can be seen from their diligent activities in doing learning tasks because they feel they need and want to achieve their real goals. Always wanting to know more about something, wanting to be known by the teacher, and showing his abilities are examples of forms of motivation that come from within oneself, while extrinsic motivation is defined as motives that are active and function because of external stimuli. Extrinsic motivation is not a true feeling or desire within students to learn. Extrinsic motivation is said to be the main purpose of individuals carrying out activities is to achieve goals that lie outside of learning activities. In other words, extrinsic motivation is an impetus for someone's behavior that is outside of the act of doing. Students who are motivated by extrinsic motivation in participating in learning activities always expect the approval of the teacher to convince them that what they are doing or what they have done are correct (Gunawan et al., 2020).

It is recognized that contemporary students possess unique learning styles shaped by their exposure to diverse media and digital platforms, the need to identify learners' learning preference and motivation is essential. However, in Manticao District, specifically within the four (4) integrated schools, a concerning trend of dropout rates, particularly among students in Grade 10, has been observed. With this, the researcher was interested in finding out the students' learning styles and their self-motivation, and the relationship between the students' learning styles and self-motivation for better learning outcomes.

This research utilized two theoretical frameworks: the Self-Determination Theory (SDT) by Ryan and Deci (2019), a thorough theory of human development and well-being with important implications for education, and the Theory of Vark Learning Styles, which is recognized as one of the most well-known and widely applied learning style theories. It has caused a paradigm change in the profession, moving away from behavioristic methods that seek to control and mold motivation from the outside in. Instead, this highlights the significance of supportive settings while stressing people's innate motivational tendencies for learning and personal improvement.

Broadbent (2021), supported Education theorist Neil Fleming was a key player in developing the VARK Learning Theory, which divides children into four learning styles: visual, auditory, reading/writing, kinesthetic/tactile, and auditory/visual. Although educators have been aware of different learning styles for a long time, systematic awareness and comprehension did not start to surface until the 1970s and 1980s. In 1987, Fleming created the VARK learning styles framework in an effort to improve the way that both teachers and students might absorb new information.

According to SDT, people are naturally inclined toward psychological development, mastery, and interpersonal relationships. But in order to thrive, these proactive instincts require favorable circumstances. In order to promote healthy growth, SDT expressly supports meeting fundamental psychological needs (Ryan et al., 2019). The three basic needs that are considered as being essential for promoting optimal growth are relatedness, competence, and autonomy.

II. METHODOLOGY

The study utilized descriptive correlational research design. Descriptive correlational design aims to uncover relationships among variables, providing a systematic and accurate description of a population, situation, or phenomenon through various research methods. This approach investigated multiple variables to understand their associations. The researcher observed how changes in one variable impact another, offering insights into the underlying mechanisms driving the phenomena being studied. Analyzing these relationships enables researchers to gain a deeper understanding of the complex dynamics within their research area. (Dovetail Editorial Team, 2023).

The data gathered went several statistical techniques for analysis. Initially, descriptive statistics was employed to summarize, translate, and interpret the information obtained. Descriptive statistics aided in providing a clear understanding of the data through calculations of Mean, Standard Deviations, and Frequency distributions. Given that the study aimed for descriptive analysis, frequency count and percentage distribution were utilized extensively. To address Problems 1 and 2, which involved understanding the characteristics and patterns within the data, descriptive statistics was pivotal. This entailed calculating the Mean values, Standard Deviations to measure the spread of data, and frequency distributions to ascertain the occurrence of different values within the dataset. For Problem 3, which sought to explore the relationship between students' learning styles and students' self-motivation, the researcher employed the Pearson Product Moment Correlation Coefficient. This statistical method

Students' Learning Preferences and Motivation

was used to determine the strength and direction of the linear relationship between two variables. By analyzing the correlation coefficient, the researcher could assess whether there was a significant relationship between students' learning styles and students' self-motivation.

III. RESULTS AND DISCUSSION

Problem 1. What is the level of the students' learning preferences in terms of:

- 1.1 auditory;
- 1.2 visual; and
- 1.3 tactile?

Table 1: Overall Learning Preference

Variables	Mean	SD	Description	Interpretation
Auditory	3.67	0.61	Often	High
Visual	3.63	0.62	Often	High
Tactile	3.79	0.59	Often	High
Overall	3.70	0.61	Often	High
Note: 4.21 – 5.00 Very High 3.41 – 4.20 High 2.61 – 3.40 Moderate 1.81 – 2.60 Low 1.00 – 1.80 Very Low				

Table 1 shows the *Overall Learning Preference*. It has an overall Mean of 3.70 with SD= 0.61, described as Often and interpreted as High. The result indicated that respondents in this context often exhibit a combination of auditory, visual, and tactile learning preferences. Recognizing and accommodating these diverse learning preferences can empower educators to design more effective learning experiences that cater to the needs of all students. By leveraging insights into auditory, visual, and tactile learning styles, educators can create dynamic and engaging instructional strategies that promote meaningful learning and enhance overall student achievement. It is important to note that the learning styles of the students must be considered in formulating various class lessons and activities so that the students can have fair opportunities to learn and acquire knowledge and skills.

Recognizing the diverse learning style preferences among students enhance the effectiveness of learning experiences. Alavi and Toozandehjani (2017) asserted that familiarity with students' learning styles not only improves their learning outcomes but also fosters self-actualization. Specifically, the tactile learning style as it got the highest with the Mean of 3.79 with SD=0.59, described as often and interpreted as high. This implies that the respondents often learn best when engaged in practical tasks, manipulatives, or other tactile experiences.

Moreover Cook (2023) stated that hands-on learning activities improved learners' comprehension of all topics, being presented. Through experiential learning, tactile learners can engage with instructional materials through physical interaction, which strengthens their understanding and learning objectives. In the subject areas like Science and MAPEH, learning by doing or through experience becomes more important for the students as they perform experiments and other form of role play and presentations.

On the other hand, visual learning style, is the lowest learning style with a Mean score of 3.63 with SD =0.62, described as Often and interpreted as High. Even though this study gives a lower ranking to visual learning styles, it is important to understand that accommodating different learning modes is crucial to providing thorough and efficient education. Students have difficulty or challenges on just looking and visual aids without the thorough explanations from the teachers. It is important for the teachers to not just provide lesson materials but definitely provide explanations and information that is required of a certain topic. For the learning process to achieve maximum effectiveness, students must be encouraged to be actively engage and directly experience it firsthand aside from the teacher's explanations. In this way, they can continue to learn and slowly developed themselves to be an independent learner (Wege et al., 2022).

Additionally, Tuken and Pasinggi (2018) proposed that the learning process becomes more effective when students are directly engaged in hands-on work, enabling them to think critically, make observations, and draw conclusions from their experiences. Experience is still considered to be the best way of learning and acquiring new knowledge and skills that can be utilized in their daily activities.

Moreover, the teachers can build inclusive learning environments that can meet the different needs of their students by utilizing a combination of tactile, visual, and aural teaching modalities (Pamon and Oco, 2024). It is only fitting that teachers may

Students' Learning Preferences and Motivation

continue to be patient, observant and innovative in their teachings so that the students will continue to have the excitement and interest to study and learn more. Fostering excitement and sustained interest in learning through patience, observation, and innovation.

Problem 2. What is the level of students' motivation in terms of:

- 2.1 intrinsic; and
- 2.2 extrinsic?

Table 2 on the next page reflects students' overall level of motivation with an overall Mean of 4.19 with SD= 0.59, described as Often and interpreted as Above Average. This suggests that participants are highly motivated, both intrinsically and extrinsically, showing a strong desire to be part in school activities and to succeed in everything that they do. Motivation is important to the students as they are still on the level of acquiring new knowledge and skills and in-preparation for the real-life struggles, challenges and experiences. They must be motivated so that they can acquire ample of information so that by the time they are on their own they are prepared and can easily make the necessary adjustments and that giving up will only become part of their last resort.

Table 2: Students' Motivation

Variables	Mean	SD	Description	Interpretation
Intrinsic Motivation	4.12	0.61	Often	Above Average
Extrinsic Motivation	4.25	0.57	Always	Very High
Overall	4.19	0.59	Often	Above Average
Note: 4.21 – 5.00 Very High 3.41 – 4.20 Above Average 2.61 – 3.40 Average 1.81 – 2.60 Below Average 1.00 – 1.80 Very Low				

The capacity to consistently inspire oneself to pursue one's objectives and aspirations without depending on outside influences is known as self-motivation. It is what keeps one moving forward toward achievement even in the face of adversity, it is a skill that can indeed be cultivated and enhanced through deliberate effort and practice (Pradeepa, 2024). This can only be done and achieved with the presence, assistance and guidance of the teachers and even their parents.

Extrinsic motivation was rated with the higher Mean of 4.25 with SD= 0.57, described as always and classified as very high in terms of motivation, suggesting that students are consistently motivated by external factors such as praises, grades or rewards. This only means that the students are putting more emphasis of tangible things than the unseen ones. They want action than just mere words.

The occurrence of extrinsic motivation over intrinsic motivation suggests that contemporary children are more inclined towards seeking rewards or engaging in activities primarily for external incentives rather than inherent enjoyment or personal satisfaction. Academic motivation plays a crucial role in determining academic outcomes and student success in their studies (Berestova et al., 2022). Sanguras (2021) identified that a fixed mindset is characterized by the belief that skills are unalterable and tied to external motivation. This mindset significantly influences how individuals respond to external incentives and their overall approach to learning and problem-solving.

Moreover, Incentives serve as motivators for students, inspiring them to increase their productivity as they experience a sense of pride and accomplishment when they succeed. This positive reinforcement creates a cycle where success leads to happiness, further reinforcing the desire to strive for excellence.

External support systems, such as teachers, parents, or mentors, play a crucial role in helping students overcome their challenges and reignite their motivation to learn. By providing encouragement, guidance, and constructive feedback, educators can help students identify strategies for improvement and regain confidence in their abilities (Chen, 2023).

Meanwhile, intrinsic motivation has the lower level with the Mean score of 4.12 with SD=0.61, described as often and interpreted as above average. The data suggests that students frequently experience intrinsic motivation. When students participate in learning activities, they are normally driven by internal causes such as curiosity, enjoyment, and personal fulfillment. The students feel that being appreciated is also a nice and positive feeling. The only challenge is that if they are not used to hearing it as they sometimes feel awkward or shy about it sometimes. Teachers must therefore teach them to be more expressive of their thoughts and emotions.

Brown (2024) stated that students must be taught and inspired to express themselves and their feeling even if it is negative or not. This will help them release the tensions they feel inside of them which can turn into anxiety or even negative thoughts. This can further lead to discouragement and lack of enthusiasm towards their studies and activities. Teachers and

Students' Learning Preferences and Motivation

parents must also be sensitive to their students to detect their emotional conditions so that they can do and provide necessary adjustments and even counselling.

Problem 3. Is there a significant relationship between students' learning preferences and motivation?

Table 3: Test of Correlation on Students' Learning Preference and Motivation

Variables	r-value	p-value	Level of Correlation	Description	Interpretation
Auditory	0.463	0.041	Low Positive Correlation	Reject Ho	Significant
Visual	0.436	0.004	Low Positive Correlation	Reject Ho	Significant
Tactile	0.635	0.001	Moderate Positive Correlation	Reject Ho	Significant

Note: Significant if computed p-value is less than 0.05 level of significance

Table 3 shows the results of the correlation test between students' learning preference in terms of auditory, visual, and tactile, and their self-motivation. The table indicates that there is a significant correlation between students' learning preferences and their motivation with the rejection of the null hypothesis and the computed p-value lower than 0.05.

In terms of auditory, it registered an r-value = 0.463 with $p < 0.041$ indicating low positive correlation with self-motivation. Thus, rejecting the null hypothesis. This implies that learning style in terms of auditory has connection towards the motivation of the students. Although it only allow positive level, its importance is undeniable as it can contribute positively towards the students' level of motivation. High level of motivation can contribute to doing better in everything they do which can lead to better results as well. Throughout the learning journey, students must continue a high level of motivation to maintain focus and effectively absorb the presented information. Tailoring the learning style and motivation to align with students' capabilities can enhance their ability to comprehend and master information efficiently.

Students' motivation serves as the fuel that propels the engine of learning forward, highlighting its crucial role in the learning process. According to Kayalar (2017) auditory learners find that excessive noise can easily disrupt their focus and concentration. Nevertheless, they have observed that verbalizing problems and information aids in their comprehension and retention, indicating a preference for auditory learning and interactive participation.

Additionally, visual learning style also has a low positive correlation towards self-motivation but its computed $r = 0.436$, and $p < 0.004$ indicating significant correlation. Thus, also rejecting null hypothesis. This means that individuals who prefer visual learning tend to also exhibit good relationships in their level of self-motivation. This further indicates that when the teachers can provide necessary adjustment catering students that are visual learners, they become more interested and inspired towards learning. It is important to note that the strength of this relationship is considered relatively weak based on the level of correlation, but it must never be overlooked by the teachers and the parents.

According to Cornell (2024), the effectiveness of visual learning depends on various factors, including individual learning styles, cognitive abilities, and prior experiences. While some students find visual learning environments engaging and effective for processing information, others may struggle due to factors such as attentional difficulties and visual processing challenges. It is important for the teachers to make sure that the instructional materials they provide for visual learners are well selected and crafted.

Tactile learning style has a moderate positive correlation with self-motivation. It registered a computed $r = 0.635$ and $p < 0.001$ indicating significant relationship. Thus, the null hypothesis is rejected. The result shows a significant level of suggestion that individuals who prefer tactile learning methods tend to have higher levels of self-motivation. The strength of this relationship is considered moderate, as the correlation coefficient is relatively high. By rejecting the null hypothesis, it is being shown that there is indeed a relationship between tactile learning style and self-motivation. This implies that as individuals engage more in tactile learning activities, they are also more likely to demonstrate higher levels of self-motivation. Moreover, the students are more inspired towards their studies when their teachers provide activities about their lessons that include real-life situation application and activities. They find it more interesting as they encounter first-hand experiences.

According to Hart (2019), utilizing play-based learning techniques provides an avenue for children who struggle with concentration and comprehension in traditional educational settings to excel. The progress of students can be influenced by their individual learning styles. Tactile learners, also known as require physical activity to fully grasp and remember the material being taught. In the realm of educational research, tactile learners, distinguished by their kinesthetic inclination, demonstrate an affinity for visualizing and constructing conceptual models.

Students' Learning Preferences and Motivation

IV. CONCLUSIONS

The results of the study lead to the following conclusions:

1. The high level of learning styles among students demonstrates their capacity to participate in the learning process in an efficient manner.
2. Students prefer external rewards or recognition. Additionally, intrinsic motivation was also above average indicating that pupils are somewhat motivated by internal fulfillment and personal interest. Therefore, the null hypothesis was rejected
3. Students' learning preferences have a significant positive correlation to self-motivation contributing to overall students' learning experiences.

V. RECOMMENDATIONS

The conclusions led to the following recommendations:

1. Teachers may look closely at their students' learning style. By identifying learning preferences, they can contextualize their teaching strategies to have a better match with their students' needs.
2. Acknowledging and nurturing students' self-motivation encourage independence in learning and better performance. When students experience greater satisfaction and fulfillment in their education it will also lead to a positive sense of self-esteem, confidence, and performance.
3. The relationship of learning styles on self-motivation is present. Teachers can effectively cater to the needs of the learners and enhance their self-motivation to engage in the learning process by allowing them to manipulate objects, explore concepts through touch, and experiment with different strategies or techniques can fuel their motivation to learn and succeed.

REFERENCES

- 1) Adamma, O. N., Ekwutosim, O. P., & Unamba, E. C. (2018). Influence of extrinsic and intrinsic motivation on pupils academic performance in mathematics.
- 2) Alavi, S., & Toozandehjani, H. (2017). The Relationship between Learning Styles and Students' Identity Styles. *Open Journal of Psychiatry*, 07(02), 90–102. <https://doi.org/10.4236/ojpsych.2017.72009>
- 3) Alzahrani, Majed Gharmallah, (2017). The Effect of Using Online Discussion Forums on Students' Learning
- 4) Amalia, S., Fitria, W., Ramdhani, M., & Suryani, H. (2021). EFL Students' Needs and Achievement: A Study at an Islamic University in Jambi. *Ta'dib: Jurnal Pendidikan Islam*, 26(1), 29-42.
- 5) Arnholz, Jonathan. (2019). Is Hands-On Learning Better?
- 6) Asif, S., Kamal, A., Fahim, M., Naveen, N., & Yousaf, F. (2018). Exploring Gender Differences in Academic Motivation Among Adolescents
- 7) Astri, Z., & Wahab, I. (2018). The Effect of Reading Teaching Material for Different Learning Styles in Improving Students' Reading Comprehension
- 8) Bafadal, Juharyanto, A. Nurabadi, and Gunawan, (2020). Efforts to Improve The Integrity of the Principal with the Moral Debate Model, in *Proceedings of the 4th International Conference on Education and Management (COEMA 2019)*, pp.1–4.
- 9) Bedford, S. (2017). Growth mindset and motivation: a study into secondary school Science learning.
- 10) Ben Janse, John Dewey Theory of Learning by Doing explained, (2023). <https://www.toolshero.com/change-management/john-dewey-theory/>
- 11) Berestova, A., Burdina, G., Lobuteva, L., & Lobuteva, A. (2022). Academic Motivation of University Students and the Factors That Influence It in an E-Learning Environment. *Electronic Journal of e-Learning*, 20(2), 201-210. (PDF) Academic Motivation of University Students and Intrinsic and Extrinsic Goals as Predictors.
- 12) Bhatt, S. & Bahadur, A. (2020). Importance of self-esteem & self-efficacy for college students.
- 13) Bhakti, Y. B., Astuti, D., & Agustina, I. (2018). The influence process of science skill and motivation learning with creativity learn. *Journal of Education and Learning*, 12(1), 30-35 (PDF) Learning Styles: A Motivation to Study Habits of Students.
- 14) Broadbent, Katie, (2021). 4 Different Learning Styles: The VARK Theory Want to become a more effective learner? Discover VARK theory - the 4 different Learning styles that explain how we process and understand new information.
- 15) Brown, Lachlan, (2024). 10 ways to show you're intelligent without saying a word, according to psychology
- 16) Cabual, Reynaldo Abrea (2021) Learning Styles and Preferred Learning Modalities in the New Normal. *Learning Styles and Preferred Learning Modalities in the New Normal (scirp.org)*
- 17) Carpenter, M. E. (2020). The Difference Between Tactile & Kinesthetic.
- 18) Cook, S. (2023) Meet Your Learning Abled Kids Educational Coach Meet Your Learning Abled Kids Educational Success Coach ~ Learning Abled Kids

Students' Learning Preferences and Motivation

- 19) Chalmers, C., Carter, M., Cooper, T., and Nason, R. (2017). Implementing "big ideas" to advance the teaching and learning of science, technology, engineering, and mathematics (STEM). *International Journal of Science and Mathematics Education*, 15, 25-43. DOI: 10.1007/s10763-017-9799-1
- 20) Chania, Y., Haviz, M., & Sasmita, D. (2017). Hubungan Gaya Belajar Dengan Hasil Belajar Siswa Pada Pembelajaran Biologi Kelas X Sman 2 Sungai Tarab Kabupaten Tanah Datar. *Sainstek : Jurnal Sains Dan Teknologi*, 8(1), 77. <https://doi.org/10.31958/js.v8i1.443>
- 21) Chen, C., Jones, K. T., & Xu, S. (2018). The Association between Students' Style of Learning Preferences, Social Presence, Collaborative Learning and Learning Outcomes. *Journal of Educators Online*, (PDF) Learning Styles: A Motivation to Study Habits of Students. Available from: https://www.researchgate.net/publication/339644686_Learning_Styles_A_Motivation_to_Study_Habits_of_Students
- 22) Chen, Zihan, (2023), The Influence of School's Reward Systems on Students' Development
- 23) Chirugaru, S. (2020). The Essential Skills of 21st Century Classroom (4Cs) Project: The role of 4Cs (Critical Thinking, Creative Thinking, Collaboration and Communication) in the 21st Century Classroom.
- 24) Cornell, Dave and Drew, Christ, (2024). Tactile Learning: Definition and Examples Tactile Learning: Definition and Examples (2024) (helpfulprofessor.com)
- 25) Guo, E. M. McTigue, S. D. Matthews, and W. Zimmer. (2020). The impact of visual displays on learning across the disciplines: A systematic review, *Educ. Psychol. Rev.* 32, 627.
- 26) Dovetail Editorial Team, (2023). What is causal research design? <https://dovetail.com/research/causal-research/>
- 27) Domenico, Stefano, Ryan, Richard M. (2017) The Emerging Neuroscience of Intrinsic Motivation: A New Frontier in Self-Determination Research
- 28) Eisenkraft, N., Elfenbein, H. A., & Kopelman, S. (2017). We know who likes us, but Not who competes against us: Dyadic meta-accuracy among work colleagues. *Psychological Science*, 28, 233–241.
- 29) Elrick, L. (2018). 4 Types of Learning Styles: How to Accommodate a Diverse Group of Students. Retrieved from Ramussen College: <https://www.rasmussen.edu/degrees/education/blog/types-of-learning-styles>
- 30) Fang, N., Bin Daud, M., Al Haddad, S. A. H., & Mohd-Yusof, K. (2017). A quantitative investigation of learning styles, motivation and learning strategies for undergraduate engineering students. *Global Journal of Engineering Education*, 9, 1-6.
- 31) Farland-Smith, D., Finson, K. D., & Arquette, C. M. (2017). How picture books on The National Science Teachers' association recommend list portray scientists. *School Science and Mathematics*, 117(6), 250–258. <https://doi.org/10.1111/ssm.12231>
- 32) Fleming, Grace, (2020). The Auditory Learning Style Auditory Learning Strategies and Characteristics ([thoughtco.com](https://www.thoughtco.com))
Hamdi Serin, (2018). The Use of Extrinsic and Intrinsic Motivations to Enhance Student Achievement in Educational Settings. DOI: 10.23918/ijsses.v5i1p191
- 33) Gunawan, Imam, Desi Eri Kusumaningrum, Djum Djum Noor Benty, Raden Bambang Sumarsono, Ahmad Nurabadi, Lestari Handayani. (2020). Student Learning Motivation: A Conceptual Paper
- 34) Guo D, McTigue EM, Matthews SD, Zimmer W. (2020). The impact of visual displays on learning across the disciplines: A systematic review. *Educational Psychology Review*
- 35) Habok, Anita, Zaw, Tun, and Magyaw, Andrea, (2024) The effect of reading strategy use on online reading comprehension- *ScienceDirect*
- 36) Han, J., & Yin, H. (2017). Teacher motivation: Definition, research development and implications for teachers.
- 37) Hart, Sara, (2019). tactile learning: the importance of hands-on activities for children
- 38) Holmström Ingela, and Schönström Krister. (2018). Deaf lecturers' translanguaging in a higher education setting. A multimodal multilingual perspective. *Applied Linguistics Review* 9: 89–111.
- 39) Ilcin, N. T. (2018). The relationship between learning styles and academic performance in Turkish physiotherapy students. *BMC Medical Education*
- 40) Ilkay Bugdayci and Huseyin Zahit Selvi, (2021). Do Maps Contribute to Pupils' Learning Skills in Primary Schools?
- 41) Jiang, Helen. (2023). Learning via Visual-Tactile Interaction, learning via Visual- Tactile Interaction (cmu.edu)
- 42) Kayalar F. (2017). The effects of Auditory Learning Strategy on Learning Skills of Language Learners (Students' Views)
- 43) Khalil, N. M., & Osman, K. (2017). STEM-21CS Module : Fostering 21st Century Skills through Integrated STEM. *K-12 STEM Education*, 3(3), 225–233.
- 44) Khrameh, T. (2018). Relationship between Academic Self-efficacy and Motivation among Medical Science Students. *Journal of Clinical and Diagnostic Research*. 12. JC07-JC10. 10.7860/JCDR/2018/29482.11770
- 45) Kelly, Melissa (2019) 10 Strategies to Increase Student Reading Comprehension. 10 Strategies to Increase Student Reading Comprehension ([thoughtco.com](https://www.thoughtco.com))

Students' Learning Preferences and Motivation

- 46) Kolb D. and Kolb A. (2017). The Experiential Educator: Principles and Practices of Experiential Learning (PDF) The Experiential Educator: Principles and Practices of Experiential Learning (researchgate.net)
- 47) Jirout, J., Vitiello, V., and Zumbrunn, S. (2018). "Curiosity in schools," in The New Science of Curiosity, ed. G. Gordon (Hauppauge, NY: Nova).
- 48) Labu, N. (2021). Analysis of the characteristics of visual, auditory, and kinesthetic learning styles among the 10th-grade students of SMAK St. Petrus Ende in the academic year 2019/2020.
- 49) Lelasari, T., Yohanita, A. M., & Damopolii, I. (2021). Effect of inquiry science learning on students' metacognitive skill. *Journal of Research in Instructional*, 1(1), 53–60. <https://doi.org/10.30862/jri.v1i1.12>
- 50) Longenecker, Clinton, (2017). Lessons for improving your formal performance appraisal process
- 51) Major, Sarah M.Ed. (2022) 16 Characteristics of Kinesthetic and Tactile Learners 16 Characteristics of Kinesthetic and Tactile Learners (child1st.com)
- 52) McDonald, Michelle, (2023). The Importance of Teaching Map Skills and How I've Got You Covered The Importance of Teaching Map Skills and How I've Got You Covered (strategiceducationalservices.com)
- 53) Ncube, Thandukwazi R, Zondo, Dumisani, (2018) Intrinsic Motivation and Business Competences as Predictors of Small and Medium Growth: SME Owner's Viewpoint
- 54) Ng, B. (2018). The Neuroscience of growth mindset and intrinsic motivation. *Brain Sciences*, 8(2). <https://doi.org/10.3390/brainsci8020020Orosz>,
- 55) Nikolopoulou, K. (2022). Online education in early primary years: Teachers' practices and experiences during the COVID-19 pandemic. *Education Sciences*, 12(2), 76. <https://doi.org/10.3390/educsci12020076>
- 56) Nurennny, N., and Hidayat, R. (2020). The influence of extrinsic motivation and work experience on employee performance
- 57) Oclaret, Venjie. (2021). Impact of Academic Intrinsic Motivation Facets on Students' Academic Performance. Project: Impact of Academic Intrinsic Motivation Facets on Students' Academic Performance
- 58) Ojewola, Florence O., PhD Faremi, Yinusa A., PhD. (2018) Achievement Motivation and Parenting Styles in Promoting Effective Learning Among Secondary School Students in Ondo State
- 59) Paepcke-Hjeltness, V., & Lu, T. (2018) Design for visual empowerment: Sketch noting, breaking the rules International Design Conference for Design, New Orleans, LA, Sept 2018. Industrial Designers Society of America. <http://www.idsa.org/educationpaper/design-visual-empowerment>
- 60) Pamon, E. Q., & Oco, R. M. (2024). Teachers' Competence and Learners' Academic Performance. *International Journal of Multidisciplinary Research and Analysis*, 7(3), 1375–1283. DOI: 10.47191/ijmra/v7-i03-63
- 61) Peter Miksza, Julia T. Shaw, Lauren Kapalka Richerme, Phillip M. Hash, Donald A. Hodges, Elizabeth Cassidy Parker, (2023). 12 Quantitative Descriptive and Correlational Research Get Access Arrow Pages 241–C12P143 <https://doi.org/10.1093/oso/9780197639757.003.0012>
- 62) Priest, R. & Yandell, L. (2019). Academic motivations and group dynamics. 10.13140/RG.2.2.36513.63847.
- 63) Renard, Lucie. (2020). Using reward systems to motivate students <https://www.bookwidgets.com/blog/2017/01/using-reward-systems-to-motivate-students>
- 64) Ryan, R. M., & Deci, E. L. (2019). Brick by brick: The origins, development, and future of self-determination theory. In A. J. Elliot (Vol. Ed.), *Advances in motivation science* (pp. 111–156). Cambridge, MA: Elsevier Inc. <https://doi.org/10.1016/bs.adms.2019.01.001>.
- 65) Rita, M., Randa Payangan, O., Rante, Y., Tuhumena, R., and Erari, A. (2018). Moderating effect of organizational citizenship behavior on the effect of organizational commitment, transformational leadership and work motivation on employee performance
- 66) Samsuddin, S. F., Mohamed Shaffril, H. A., Bolong, J., & Mohamed, N. A. (2019). Understanding the reading habit and attitudes among the rural community in low literacy rate areas in Malaysia: Rural library perspectives. *Library Management*, 41(1), 39–52. <https://doi.org/10.1108/LM-06-2019-0037>
- 67) Sanguras, L. Y. (2021). Integrating Grit, Mindsets, and Motivation. In *Grit in the Classroom*. <https://doi.org/10.4324/9781003235385-4>
- 68) Sanju Pradeepa, (2024). What is Self-Motivation: A Comprehensive Guide to Success What is Self-Motivation: A Comprehensive Guide to Success (believeinmind.com)
- 69) Sari, P. (2019). Analysis of Edgar Dale's cone of experience and the diversity of learning styles to select the appropriate media in education. *Mudir: Journal of Educational Management*. 1(1), 42–57. <https://doi.org/10.55352/mudir.v1i1.27>

Students' Learning Preferences and Motivation

- 70) Singh, V. (2017). Exploring the relationship between cognitive style and learning style with academic achievement of elementary school learners. *Educational Quest-An International Journal of Education and Applied Social Sciences*, 8(spl), 413–419.
- 71) Shah, P. E., Weeks, H. M., Richards, B., and Kaciroti, N. (2018). Early childhood curiosity and kindergarten reading and math academic achievement. *Pediatr. Res.* 84, 380–386. doi: 10.1038/s41390-018-0039-3Turgeon
- 72) Shin, Matt & Johnson, Zac D. (2020). From student-to-student confirmation to students' self-determination: an integrated peer-centered model of self-determination theory in the classroom
- 73) St. Louis, M. (2017). How to Spot Visual-, Auditory-, and Kinesthetic-Learning Executives How to Spot Visual-, Auditory-, and Kinesthetic-Learning Executives | Inc.com
- 74) Suleiman Sa'adu Matazu¹, Akilu Isma'il (2024). Theoretical Frameworks and Empirical Evidences of Tactile Learning Style as a Veritable Tool for Improving Biology Performance among Secondary School Students
- 75) Tuken, R., & Pasinggi, Y. S. (2018). Application of the Contextual Teaching and Learning (CTL) Approach to Improve Learning Outcomes of PGSD Study Program Students at UNM Parepare Campus in the PKn I Course. *Educational Publication Journal*
- 76) Van Egmond MC, Navarrete Berges A, Omarshah T, Benton J. (2017). The Role of Intrinsic Motivation and the Satisfaction of Basic Psychological Needs Under Conditions of Severe Resource Scarcity. *Psychol Sci.* 28(6):822–28 (PDF) The Structure of Intrinsic Motivation. Available from: https://www.researchgate.net/publication/356062770_The_Structure_of_Intrinsic_Motivation [accessed Apr 18 2024].
- 77) Vidal, C. (2017). Visual Learning: A Learner Centered Approach to Enhance English Language Teaching
- 78) Wang Qiuying, and Andrews Jean F. (2017). Literacy instruction in primary level deaf education in China. *Deafness and Education International* 19: 63–74.
- 79) Wardani, Adetya Dewi Imam Gunawan, Desi Eri Kusumaningrum, Djum Djum Noor Benty, Raden Bambang Sumarsono, Ahmad Nurabadi, Lestari Handayani. (2020). Student Learning Motivation: A Conceptual Paper
- 80) Zagoto, M. M., Yarni, N., & Dakhi, O. (2019). The individual differences in learning styles and their implications in education. *Journal of Education and Teaching Review*
- 81) Zeng, D., Takada, N., Hara, Y., Sugiyama, S., Ito, Y., Nihei, Y., et al. (2022). Impact of intrinsic and extrinsic motivation on work engagement: a cross-sectional study of nurses working in long-term care facilities. *Int. J. Environ. Res. Public Health* 19, 1–13. doi: 10.3390/ijerph19031284
- 82) Zeyab, Alaa, Abdullah, Almodaires, Almutairi, Faisal. (2020) Thinking Differently: A Visual Note Recording Strategy to Improve Learning



There is an Open Access article, distributed under the term of the Creative Commons Attribution – Non Commercial 4.0 International (CC BY-NC 4.0) (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits remixing, adapting and building upon the work for non-commercial use, provided the original work is properly cited.